a pattern formed on a surface of a test piece including "a third step in which a plurality of sets of detection information corresponding to said plurality of inspection conditions are generated based upon an image of the surface formed by condensing at least one of specific diffracted light and scattered light from the surface of the test piece under each of said plurality of different inspection conditions," as recited in claims 1, 11 and 12.

Instead, Uchida discloses a paper money discriminator for identifying the type of a bank note by detecting colors thereof from reflected or transmitted light obtained by irradiating the bank note. See, e.g., col. 2, lines 8-13. Specifically, Uchida discloses that the paper money discriminator transmits light from the light source 9 by way of the light projecting optical filter cable 5. The surface of the bank note S is irradiated on the paper money transportation path 1 with light emitted from end surfaces of the optical fiber bundles 4 of the fiber cable 5. Reflected light is received therefrom by the end surfaces of the optical fiber bundles 4 of the light receiving optical fiber cable 6 through the color filters 8A, 8B and 8C. This light is transmitted to the color detecting sensors 10A, 10B and 10C and discrimination is carried out in the discriminating circuit 11. See, e.g., col. 4, lines 1-12. Uchida is silent about providing a surface inspection method for inspecting a pattern formed at a surface of a test piece including a third step in which a plurality of sets of detection information corresponding to the plurality of inspection conditions are generated based upon an image of the surface formed by condensing at least one of a specific diffracted light and a scattered light from the surface of the test piece under each of the different inspection conditions.

For at least the reasons discussed above, Applicants respectfully submit that Uchida fails to render obvious all the subject matter of independent claims 1, 11 and 12. Accordingly, Uchida also fails to anticipate the subject matter of claims 2, 5 and 7, which

depend from claim 1. Withdrawal of the rejection under 35 U.S.C. §103(a) is therefore respectfully solicited.

B. The Office Action rejects claims 1-12 under 35 U.S.C. §103(a) over U.S. Patent 6,222,624 to Yonezawa in view of U.S. Patent 6,166,393 to Paul et al. and further in view of Uchida et al. This rejection is respectfully traversed.

Neither Yonezawa, Paul or Uchida discloses or suggests obtaining "a logical OR of said plurality of sets of detection information" as recited in independent claims 1 and 8-12.

The Office Action acknowledges that neither reference explicitly discloses obtaining a logical OR. However, the Office Action asserts that different defects "may not be detectable under some conditions to be detected by another test since each test under different conditions will be detecting a different set of errors, it would have been obvious to decide that a defect exists if any one of the different tests shows a detectable error; this obvious 'any one' test is the logical equivalent of the claimed 'logical OR'. Uchida et al. discloses this." See the Office Action starting at, for example, page 3, item 3. Applicants respectfully disagree.

Yonezawa does not even compare different sets of detection information obtained under different inspection conditions. Rather, Yonezawa compares sets of detection information from different parts of the pattern (a pattern at a first position and a pattern at a second position on the object to be inspected having repeated patterns (see Abstract)) under similar inspection conditions (each position is illuminated with dark-field illumination and bright-field illumination). See Yonezawa at, for example, col. 7, line 48 to col. 8, line 10 and claim 1. That is, Yonezawa discloses a bright filled observation optical system arranged to provide regularly reflected light from the object to the image optical system, and a dark filled observation optical system arranged to provide disbursed reflected light from the object to the

imaging optical system. See, e.g., col. 3, lines 16-20. However, Yonezawa does not disclose that an image of the surface is formed by condensing specific diffracted light, as recited in claims 1, 11 and 12. To the contrary, Yonezawa attempts to eliminate and regulate the diffracted light for observation. See, e.g., col. 2, lines 27-32 and col. 4, lines 23-34.

Furthermore, Yonezawa fails to teach or suggest a logical OR of a plurality of sets of detection information as recited in independent claims 1 and 8-12. Instead, Yonezawa discloses only a comparison between at least two image data obtained by the image pick-up element. See, e.g., col. 2, lines 61-65.

Paul illuminates a test piece with three different wavelengths of light, and optionally under different illumination angles. Specifically, Paul discloses three beams 312, 314 and 316 of light which have different spectral characteristics, i.e., different colors. See, e.g., col. 8, lines 27-31. Paul also does not disclose that an image of the surface is formed by condensing specific diffracted light. However, at col. 13, line 1-45, Paul describes combining the various signals in different ways in order to determine whether there are any defects. Taking the logical OR of the different color signals of Paul is inconsistent with, and would destroy, the inspection process performed by Paul. Accordingly, Paul also does not disclose or suggest taking the logical OR of a plurality of sets of detection information as recited in the independent claims of this application.

Furthermore, none of the references teach or suggest a first illumination device that irradiates illumination light on the surface of a test piece at a variable first angle of incidence, and a second illumination device that irradiates illumination light from a light source formed in a slit onto the surface of the test piece at a second angle of incidence larger than the first angle of incidence, as recited in claim 10.

In addition, none of the references teach or suggest a logical OR of the plurality of sets of detection information corresponding to the plurality of diffraction

conditions generated based upon the detected light in the third step and the detection information corresponding to the plurality of inspection conditions that are generated based upon an image of the surface formed by condensing at least one of specific diffracted light and scattered light from the surface of the test piece under each of the plurality of different inspection conditions.

Accordingly, the Office Action has failed to established a prima facia case of obviousness, as the applied references fail to teach or suggest all of the subject matter of independent claims 1 and 8-12. Accordingly, the applied references fail to render obvious the subject matter of claims 3-7, which depend from independent claim 1. Withdrawal of the rejection under 35 U.S.C. §103(a) is therefore respectfully solicited.

II. CONCLUSION

In view of the foregoing, Applicants respectfully submit that this application is in condition for allowance. Favorable reconsideration and prompt allowance are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the telephone number listed below.

Respectfully submitted,

Mario A. Costantino
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MAC:RZE/dmw

Date: February 6, 2003

Attachment:
Appendix

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P.O. Box 19928
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Telephone: (703) 836-6400

DEPOSIT ACCOUNT USE AUTHORIZATION
Please grant any extension necessary for entry;
Charge any fee due to our Deposit Account No. 15-0461

Docket No. Application No.

APPENDIX

Changes to Claims:

Claim 2 is canceled.

The following is a marked-up version of the amended claims:

1. (Amended) A surface inspection method for inspecting a pattern formed at a surface of a test piece, comprising:

a first step in which a plurality of inspection conditions that are different from each other are set;

a second step in which light from the surface of the test piece is detected by irradiating illumination light onto the surface of the test piece under each of said plurality of inspection conditions;

a third step in which a plurality of sets of detection information corresponding to said plurality of inspection conditions are generated based upon ~~the detected light~~an image of the surface formed by condensing at least one of specific diffracted light and scattered light from the surface of the test piece under each of said plurality of different inspection conditions;

a fourth step in which a logical OR of said plurality of sets of detection information is obtained; and

a fifth step in which a decision is made as to whether or not said pattern at the surface of the test piece is acceptable based upon results of the logical OR.

11. (Amended) A recording medium having recorded therein a program employed in a surface inspection apparatus that conducts an inspection of a pattern formed at a surface of a test piece, said program comprising:

a first instruction for setting a plurality of different inspection conditions;

a second instruction for detecting light originating from the surface of the test piece by irradiating illumination light onto the surface of the test piece under each of said plurality of inspection conditions;

a third instruction for generating a plurality of sets of detection information corresponding to said plurality of inspection conditions based upon ~~the detected light~~an image of the surface formed by condensing at least one of specific diffracted light and scattered light from the surface of the test piece under each of said plurality of different inspection conditions;

a fourth instruction for obtaining a logical OR of said plurality of sets of detection information; and

a fifth instruction for making a decision as to whether or not said pattern at the surface of the test piece is acceptable based upon results of said logical OR.

12. (Amended) A data signal embodied in a carrier wave comprising a program employed in a surface inspection apparatus that conducts an inspection of a pattern formed at a surface of a test piece, said program comprising:

a first instruction for setting a plurality of different inspection conditions;

a second instruction for detecting light originating from the surface of the test piece by irradiating illumination light onto the surface of the test piece under each of said plurality of inspection conditions;

a third instruction for generating a plurality of sets of detection information corresponding to said plurality of inspection conditions based upon ~~the detected light~~an image of the surface formed by condensing at least one of specific diffracted light and scattered light from the surface of the test piece under each of said plurality of different inspection conditions;

a fourth instruction for obtaining a logical OR of said plurality of sets of detection information; and

a fifth instruction for making a decision as to whether or not said pattern at the surface of the test piece is acceptable based upon results of said logical OR.